El Salvador - Rural Electrification - Solar Panels

Report generated on: April 26, 2017

Visit our data catalog at: https://data.mcc.gov/evaluations/index.php

Overview

Identification

COUNTRY
El Salvador

EVALUATION TITLE
Rural Electrification - Solar Panels

EVALUATION TYPE
Independent Performance Evaluation

ID NUMBER
DDI-MCC-SLV-SI-PE-2017-v01

Version

VERSION DESCRIPTION
Not applicable to this evaluation; no quantitative data to be shared

Overview

ABSTRACT
This is a summative qualitative performance evaluation (PE) of the solar panel component of the solar panel component of the RE Sub-Activity. The final report will include information from the impact evaluation (IE) of the grid component of the project as a complement to the data collected on the PE for the solar panel component. The PE will utilize the IE data--understanding that it examined a different population-as a benchmark, along with the additional data gathered from field visits, the literature review on the solar panels, and basic implementation to evaluate the Sub-Activity.

All of the evaluation questions are derived from the program logic and are ultimately linked to the economic rate of return (ERR). The ERR measures the effectiveness of a program by contrasting the discounted flows of costs and benefits of a specific intervention. This is directly tied to the outcome of reduced price of electricity, which should yield a positive ERR for the intervention. Data from the IE of the RE Sub-Activity shows an ERR of 19.4 percent. This specific aspect of the RE Sub-Activity is assumed to yield a similar positive ERR. However, without any quantitative data, this PE will not be able to determine the exact ERR of the solar component.

Based on the evaluation scoping mission, conducted in El Salvador in January 2017, SI proposes a slight re-wording of the evaluation questions proposed by MCC to focus on the solar component and reflect the availability of data. Adjustments are denoted in italics.

Effectiveness:

i. To what extent was the solar panel component of the RE Sub-Activity implemented according to the original plans? (Include analysis of scope, timing, costs, and public perceptions)

a. Were the process and output targets achieved according to original plans and according to revised plans? If not, why?

ii. To what extent did the solar panel component reach the intended beneficiaries?

a. Were there any unintended beneficiaries?

b. Were some targeted households more likely than others to actually become beneficiaries?

iii. What were the facilitators of implementation and what challenges were encountered?

Outcomes:

iv. What are the perceived or observed outcomes of the solar panel component on the following:

a. Are households using the solar panels?

b. How have energy consumption patterns changed (i.e. sources of energy)?

c. Has the cost of energy changed?

d. How has total energy consumption by source changed?

e. Has household member time allocation changed (for women, men, children)?

f. Has air quality improved?

g. Has the household changed or increased their productive activities/income-generating activities?

v. What, if any, are the differential outcomes for women vs. men?

Sustainability:

vi. How sustainable are the outcomes likely to be from the solar panel component?

a. Are systems being maintained properly? Why or why not?

b. What types of households are able to maintain the solar panels?

c. Do households expect the grid to reach their homes in the near future?

Lessons Learned:

vii. What lessons can be learned from the solar component?

ERR

i. To what extent have the assumptions underlying the ERR held true?

EVALUATION METHODOLOGY
Other (Performance Evaluation)

UNITS OF ANALYSIS
Community, Individuals

KIND OF DATA
Other

TOPICS

Topic	Vocabulary	URI
Energy		
Elecrification		
Solar Power		
Renewable Energy		

KEYWORDS
Solar Power, Electrification, Rural, Community, Development, Evaluation, Qualitative

Coverage

GEOGRAPHIC COVERAGE
The team will conduct data collection in the capital city of El Salvador, San Salvador as well as rural areas of Morazán, Chalatenango, Santa Ana, and Cabañas.

UNIVERSE
Male and female heads of households, at least one local authority in each community.

Producers and Sponsors

PRIMARY INVESTIGATOR(S)

Name	Affiliation
Social Impact, Inc.	

FUNDING

Name	Abbreviation	Role
Millennium Challenge Corporation	MCC	

Metadata Production

METADATA PRODUCED BY

Name	Abbreviation	Affiliation	Role
Millennium Challenge Corporation	MCC		Review of Metadata
Social Impact, Inc.	SI		Independent Evaluator

DATE OF METADATA PRODUCTION
2017-03-17

DDI DOCUMENT VERSION
Version 1 (Original 2017-03-17): This is the first version of the MCC El Salvador solar panel component PE evaluation design report.

DDI DOCUMENT ID
DDI-MCC-SLV-SI-PE-2017-v01

MCC Compact and Program

COMPACT OR THRESHOLD
El Salvador Compact

PROGRAM
This PE focuses on the solar panel component of the Rural Electrification (RE) Sub-Activity. The original intervention goals for this component included: · Installation of approximately 950 SPS. · The provision of technical assistance via regional community development agencies also known as Asociaciones de Desarrollo Social Comunitario (ADESCOs) to create local community associations designed to support long term SPS operation and maintenance. Due to economies of scale and savings on key components, such as photovoltaic panels, the marginal costs of installing additional systems fell substantially, ultimately dropping to $600. Due to these savings, the RE Sub-Activity was granted additional funding which enabled the installation of an additional 1000 SPS.

MCC SECTOR
Energy (Energy)

PROGRAM LOGIC
The overarching logic associated with the solar component of the RE Sub-Activity-and reflected in Annex I-is poverty reduction through economic growth. This objective drives the evaluation questions that MCC developed as well as an understanding of the short and medium-term outcomes identified. The outcomes for the solar panel component are somewhat simpler than those for the grid-based component, owing to the low power levels available to SPS homeowners. In short, MCC hypothesized that installation of SPS would provide a lower-cost form of energy to households. However, the outcomes of lower per-unit energy cost to beneficiaries was uncertain. Whereas grid based electricity can provide sufficient power for a wide variety of income generation opportunities, SPS can only provide enough power for basic lighting and low power DC appliances, such as radios or cellular phone battery chargers. On the other hand, lighting with solar power eliminates the need for candles or kerosene lamps and, therefore, can potentially improve indoor air quality while reducing

respiratory ailments. Other potential benefits include evening study times for school age children and leisure time for other activities that were not previously available. Though access to low power energy does not automatically preclude income generation activities, the options available to homeowners are more limited.

Sampling

Study Population

Male and female heads of households, at least one local authority in each community.

Questionnaires

Overview

The evaluation team will implement both key informant interview (KII) and direct observation guides.
The KII guides reveal insights and views about a program's performance. The guides ask questions on use of the solar panel systems (or lack thereof) as well as perceived outcomes. The team will work to take the KII guide a step further by including a mini-survey with closed-response questions. This permits descriptive quantification of key informant responses.
For MCC staff, GOES officials, and FOMILENIO staff, interview guides cover the planning and implementation of the solar panel component, targets and monitoring of outcomes, and perceived sustainability. For community leaders, heads of households (HOHs), and community organizations, the interview guide includes reach, perceived outcomes, gender differential outcomes, and perceived sustainability.
The PE will use both community leaders and HOHs for the KIIs to capture different perspectives about the intervention. Relative to HOHs, the community leaders would most likely provide broad answers that are an average for the community whereas the HOHs will specifically give answers regarding their experiences. Additionally, the community leaders could also provide insight on the overall sustainability of the project, since they will have a greater view of how many homes still have the solar panel systems more so than an individual recipient will likely be able to do. These interviews will help the team gain an understanding about the ground-level barriers to sustainability and glean practical lessons learned about operationalizing rural solar electrification programs. The team will disaggregate findings by gender and other salient factors as they become evident.

The team plans to conduct a five to ten minute structured observation in concert with beneficiary interviews. The guides are structured to study the component's processes and/or outcomes in their natural settings, providing a richer understanding of the situation. This may reveal conditions, problems, or patterns many interviewees may be unaware of or unable to describe adequately.
The data collection guides were developed in English and will be translated into Spanish by a local data collection firm. The Spanish interview guides will be piloted prior to the start of data collection.All interview guides are provided as external resources.

Data Collection

Data Collection Dates

Start	End	Cycle
2017-03-20	2017-04-13	N/A

Questionnaires

The evaluation team will implement both key informant interview (KII) and direct observation guides.
The KII guides reveal insights and views about a program's performance. The guides ask questions on use of the solar panel systems (or lack thereof) as well as perceived outcomes. The team will work to take the KII guide a step further by including a mini-survey with closed-response questions. This permits descriptive quantification of key informant responses.
For MCC staff, GOES officials, and FOMILENIO staff, interview guides cover the planning and implementation of the solar panel component, targets and monitoring of outcomes, and perceived sustainability. For community leaders, heads of households (HOHs), and community organizations, the interview guide includes reach, perceived outcomes, gender differential outcomes, and perceived sustainability.
The PE will use both community leaders and HOHs for the KIIs to capture different perspectives about the intervention. Relative to HOHs, the community leaders would most likely provide broad answers that are an average for the community whereas the HOHs will specifically give answers regarding their experiences. Additionally, the community leaders could also provide insight on the overall sustainability of the project, since they will have a greater view of how many homes still have the solar panel systems more so than an individual recipient will likely be able to do. These interviews will help the team gain an understanding about the ground-level barriers to sustainability and glean practical lessons learned about operationalizing rural solar electrification programs. The team will disaggregate findings by gender and other salient factors as they become evident.

The team plans to conduct a five to ten minute structured observation in concert with beneficiary interviews. The guides are structured to study the component's processes and/or outcomes in their natural settings, providing a richer understanding of the situation. This may reveal conditions, problems, or patterns many interviewees may be unaware of or unable to describe adequately.
The data collection guides were developed in English and will be translated into Spanish by a local data collection firm. The Spanish interview guides will be piloted prior to the start of data collection.All interview guides are provided as external resources.

Data Collectors

Name	Abbreviation	Affiliation
Social Impact, Inc.	SI	
ADEPRO		

Supervision

Data collection will be conducted by two teams comprised of one male and one female interviewers. One team will be comprised of SI staff members, while the other team will be comprised of SI's sub-contractor (ADEPRO) staff members. Both teams will be supported by one local logistician (provided through SI) and one local operations cooridnator (provided through ADEPRO). SI's team will be provided with transportation services by a vetted transportation and security service provider--Alpha.

The interviewers will be responsible for administerting the data collection guides and recording all data--ensuring quality assurance at all steps.

The role of the logisitician is to assist with logistical and administrative tasks while the team is in El Salvador--including arranging accommodation for the team, serving as the main point of contact with the transportation company, setting up meetings and interviews with key stakeholders, and proiving meeting supplies and resources as determined necessary by the evaluation Team Leader.

The local operations coordinator will be responsible for arranging logistics for all ADEPRO team members--including transportation, accommodation, etc.

Data Processing

No content available

Data Appraisal

No content available